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Clinical presentation and chiropractic treatment of Tietze syndrome: A 34-year-old female with left-sided chest pain

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Abstract

Objective: The purpose of this case report is to describe the clinical presentation and chiropractic management of Tietze syndrome.

Clinical Features: A 34-year-old woman presented with unexplained left-sided chest pain. Electrocardiogram and radiographs were taken at a medical emergency department to rule out cardiovascular and pulmonary causes, and pain medication did not relieve her pain. Physical examination showed tenderness on palpation and swelling of the second and third chondrosternal joints, as well as thoracic joint dysfunction. Heart and lung pathology was ruled out, and chondrosternal joint swelling was present, Tietze syndrome was diagnosed.

Intervention and Outcome: A treatment plan aimed at restoring normal thoracic and rib joint movement and decreasing inflammation of the chondrosternal joints resulted in lower pain levels. Treatment consisted of diversified high-velocity, low-amplitude chiropractic manipulation; activator technique; and cryotherapy.

Conclusion: Chiropractic management of Tietze syndrome was successful in reducing pain levels in this patient's case.

Introduction

Chest pain is a common presentation of multiple benign and pathological conditions. Rib cage joints and muscles are a relatively common source of chest pain. Pain caused by these structures presenting to primary care is sometimes wrongly attributed to angina pectoris, pleuritis, and other severe cardiopulmonary conditions; however, the cause of pain is benign in approximately 80% of cases, of which musculoskeletal chest pain accounts for almost 50%.[1] There is no formal diagnostic approach for these kinds of conditions, which makes definitive diagnosis difficult.[1] This case study describes the patient presentation and use of chiropractic care in managing this patient with Tietze syndrome.

Case report

A 34-year-old woman presented with chest pain of 2 months' duration, which started while driving. In the

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car, the patient experienced a sudden onset of left-sided chest pain, which felt as a knife stabbing along with a crushing sensation, unlike any pain she experienced before. Patterned breathing resulted in a decrease in pain intensity. The stabbing pain returned every hour and increased in intensity, causing a "giving way" of the legs. When the pain persisted the following day, still increasing in intensity and becoming constant, the patient visited a general practitioner (GP). Measurement of blood pressure and auscultation of heart and lungs revealed no abnormalities. The GP diagnosed the patient with muscle strain and sent her home with paracetamol.

After a few days, the pain medication had not relieved her pain; and the pain had spread toward the left scapula. Because the patient also experienced a sensation of shortness of breath, she revisited her GP, who suspected a pulmonary embolism. The patient was then sent to the emergency department. Chest radiographs and an electrocardiogram ruled out cardiovascular and pulmonary pathology. The patient was sent home with another kind of pain medication. After a week with no improvement of pain, the patient was sent to the hospital again, where a breast examination revealed no abnormalities. A couple of weeks later, the stabbing pain and shortness of breath had disappeared. However, physical exertion exacerbated the pain. She visited a doctor of chiropractic (DC) who was recommended to her by a family member.

Physical examination by the DC revealed that blood pressure and temperature measurements were within normal limits. Inspection of the chest showed mild swelling over the left second and third chondrosternal joints, but it was not warm to palpation. Palpation of these joints and deep inhalation were painful. Chiropractic spinal and extremity examination revealed joint restriction of rotation and lateral flexion of spinal levels T2, 3, and 4, as well as decreased costotransverse joint mobility. Sternal compression was extremely painful. Tietze syndrome was diagnosed, as heart and lung pathology were already ruled out and swelling was present over the second and third chondrosternal joints.

Treatment of the patient included explanation of the condition and reassurance about its self-limiting nature, diversified manipulation (high-velocity, low-amplitude [HVLA]) of posterior joints, and manipulation of anterior joints by means of an activator, increasing the amplitude as the swelling and tenderness over the chondrosternal joints decreased. Application of ice after treatment at home was recommended to decrease inflammation of the chondrosternal joints.

After 6 treatments over the course of 3 weeks, pain during rest and exertion was almost absent, as were the swelling over the chondrosternal joints and restriction of joint movement.

Discussion

Acute chest pain is a common cause for patients to present to primary care. As the cause may include potentially life-threatening cardiovascular or pulmonary disorders, the priority is to rule out severe pathology. As many as 80% of acute chest pain cases has a benign cause, of which almost 50% is of musculoskeletal origin. Although the musculoskeletal system accounts for the majority of acutely presenting chest pain complaints, it often does not receive the same amount of investigation as when a serious cause is suspected. As a result, a sizeable minority of patients remain undiagnosed and untreated, which may lead to further unnecessary anxiety and time off work.[1]

Constitutional, pathological, and life-threatening causes of chest pain were ruled out in this patient. Previous examinations as well as this physical examination did not reveal any abnormalities, and there was no fever noted. Because the pain was reproducible by direct mechanical stress on the joints and the swelling was mild, not warm, only 2 causes of musculoskeletal origin remained: Tietze syndrome and costochondritis. Although the presenting symptoms of Tietze syndrome can mimic numerous pathological causes of chest pain, it is much better characterized as musculoskeletal chest pain.[2]

Tietze syndrome is a rare cause of chest pain. The condition was first described by Tietze in 1921 as a benign, nonsuppurative painful swelling of the superior chondrosternal joints. Costochondritis, a differential diagnosis for Tietze syndrome, characterized by painful, tender, but nonswollen chondrosternal joints, is more common. Although these conditions are different, they are commonly mistaken for the same.[2] Tietze syndrome usually presents in young adults (younger than 40 years), both male and female. The cause of this condition is not known, but a traumatic pathogenesis cannot be excluded. There is no causal link between Tietze and profession, ethnicity, or geography; however, clustered cases have been reported. Results vary in the few pathological studies performed, from no abnormal findings to swelling and degradation of costal cartilage with associated minimal perichondrial inflammation. The

superior ribs, especially the second and third chondrosternal joints, are affected by Tietze. Joints between ribs and the sternum, manubrium, clavicle, and xiphoid process are mostly unaffected.

More than 70% of lesions are unilateral and affect one joint. Multiple lesions affect same-side neighboring joints. Chest pain is the main complaint, and a history of extreme coughing and respiratory tract infection is not uncommon. The pain varies and is localized around the involved synchondrosis but can cover the whole chest area. Coughing, deep breathing, and lying prone can increase the pain. The involved chondrosternal joint is tender and swollen; but erythema, fever, and malaise are absent.[2] Costochondritis is more common, although not exclusive, in adults older than 40 years. Also for this condition, the cause is unknown. However, there seems to be an association between costochondritis and cervical strain syndrome, coronary heart disease, and fibrositis syndrome. In 90% of cases, more than 1 chondrosternal joint is involved, showing no signs of swelling. Mostly affected are ribs 2 to 5.[2]

Diagnosing Tietze syndrome is based on exclusion of other, potentially life-threatening, conditions that affect chondrosternal joints, such as rheumatoid arthritis, pyogenic arthritis, and tumors, after careful analysis of case history, physical examination, and results of investigations. In the literature, it is recommended to use radiological evaluation to avoid misdiagnosis.[3] In this case, these differential diagnoses were ruled out based on results of electrocardiogram and radiographs. If red flags, like fever, erythema, and malaise, had been present, further investigation would have been done.

Tietze syndrome is eventually self-limiting; however, it follows a pattern of relapse and remission. The pain can spontaneously disappear after a couple of weeks or can last for months, as does the swelling over the affected joints. Treatment consists of reassurance and prescribing salicylates or nonsteroidal anti-inflammatory drugs (orally or injection).

Case reports by Aspegren et al[4] and by Rabey[5] describe an additional role of chiropractic in the treatment of Tietze syndrome and costochondritis. According to them, inflammation of chondrosternal joints is mechanical in nature, caused by repetitive straining of muscles attaching to involved ribs or a costotransverse joint dysfunction. According to Erwin et al,[6] costovertebral joints can be a cause of pain known as *pseudo-angina*. Costotransverse and costovertebral joint dysfunction can be effectively treated by means of spinal manipulation. Numerous studies have demonstrated the effectiveness of manipulation, especially HVLA manipulation. Use of HVLA manipulation in the treatment of Tietze syndrome is aimed at functional spinal lesions of costovertebral, costotransverse, and facet joints, restoring normal distribution of mechanical forces through affected joints and relieving irritation from associated chondrosternal joints. Restoring normal movement stimulates healing of nociceptive pain generators by removing pathological stress and returning to normal activity, as was shown for the patient described in this case report.[7-13]

This case report corresponds with recent literature on Tietze syndrome. This condition is often missed as a cause of severe chest pain, which is not improved by the absence of specific diagnostic tests. Most cases are eventually diagnosed by exclusion of other pathological causes of chest pain. When cardiovascular and pulmonary causes and pathology are ruled out and swelling is present over chondrosternal joints in the absence of fever and malaise in an adult 40 years of age or younger, Tietze syndrome should be the working diagnosis.

Treatment aimed at reassuring the patient, freeing up restricted joints, and decreasing swelling and irritation by ice has led to significant reduction of pain levels in this patient.

Limitations

This case report has limitations. The outcome reported in this case cannot be generalized to all patients with the diagnosis of Tietze syndrome. As well, it is possible that the patient would have improved on her own because of the normal course of the disorder; so it cannot be implied that chiropractic care was directly related to patient improvement. Additional studies need to be completed to imply causation. Further studies regarding the effectiveness of manipulative treatment of this syndrome are suggested.

Conclusion

Tietze syndrome is a differential diagnosis in the case of chest pain of musculoskeletal origin. Chiropractic management may be a possible treatment in improving the condition.

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References

1. Stochkendahl MJ, Christensen HW. Chest pain in focal musculoskeletal disorders. Med Clin North Am 2010;94 (2):259-73.
2. Fam AG, Smythe HA. Musculoskeletal chest wall pain. CMAJ 1985;133(5):379-89.
3. Guglielmi G, Cascavilla A, Scalzo G, Salaffi F, Grassi W. Imaging of sternocostoclavicular joint in spondyloarthropathies and other rheumatic conditions. Clin Exp Rheumatol 2009;27 (3):402-8.
4. Aspegren D, Hyde T, Miller M. Conservative treatment of a female collegiate volleyball player with costochondritis. J Manipulative Physiol Ther 2007;30(4):321-5.
5. Rabey MI. Costochondritis: are the symptoms and signs due to neurogenic inflammation. Two cases that responded to manual therapy directed towards posterior spinal structures. Man Ther 2008;13(1):82-6.
6. Erwin WM, Jackson PC, Homonko DA. Innervation of the human costovertebral joint: implications for clinical back pain syndromes. J Manipulative Physiol Ther 2000;23(6): 395-403.
7. Hurwitz EL, Morgenstern H, Kominski GF, Yu F, Chiang LM. A randomized trial of chiropractic and medical care for patients with low back pain: eighteen-month follow-up outcomes from the UCLA low back pain study. Spine (Phila Pa 1976) 2006;31 (6):611-21.
8. Sherman KJ, Cherkin DC, Deyo RA, Erro JH, Hrbek A, Davis RB, et al. The diagnosis and treatment of chronic back pain by acupuncturists, chiropractors, and massage therapists. Clin J Pain 2006;22(3):227-34.
9. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. Spine J 2004;4 (3):335-56.
10. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, et al. Cervical Overview Group. A Cochrane review of manipulation and mobilization for mechanical neck disorders. Spine (Phila Pa 1976) 2004;29(14):1541-8.
11. Cherkin DC, Sherman KJ, Deyo RA, Shekelle PG. A review of the evidence for the effectiveness, safety, and cost of acupuncture, massage therapy, and spinal manipulation for back pain. Ann Intern Med 2003;138(11): 898-906.
12. Cooperstein R, Perle SM, Gatterman MI, Lantz C, Schneider MJ. Chiropractic technique procedures for specific low back conditions: characterizing the literature. J Manipulative Physiol Ther 2001;24(6):407-24.
13. Triano JJ. Biomechanics of spinal manipulative therapy. Spine J 2001;1:121-30.